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## NOTES ON VITAL STATISTICS.

Dr. Fr. Prinzing's essay on *Die Kindersterblichkeit in Stadt und Land*, published in the November, 1900, number of the *Jahrbücher für Nationalökonomie und Statistik*, is a splendid bit of research and will be a classic in the study of infantile mortality. The author first reviews the literature on the subject and then proceeds to an elaborate analysis of the statistics of the various states and districts of the German Empire and Austria-Hungary, comparing each city with the rural districts adjacent. In Prussia, with the exception of Berlin and Hohenzollern and a few other provinces, the infantile death-rate is higher in the city than in the country. The totals for the kingdom are as follows:—

## DEATHS OF CHILDREN UNDER 1 YEAR TO 100 BIRTHS, IN PRUSSIA, 1893-97.

|                                 | In the cities. | In the country. | Total. |
|---------------------------------|----------------|-----------------|--------|
| All children . . . . .          | 21.4           | 19.5            | 20.2   |
| Legitimate children . . . . .   | 19.7           | 18.5            | 18.9   |
| Illegitimate children . . . . . | 37.3           | 33.2            | 35.1   |

The still-births are next considered, and the fact that the still-births among illegitimate children are almost universally higher in the city, while among legitimate children the country shows a slight excess, is explained by the fact that in the city the mothers of illegitimate children more often conceal their pregnancy and continue to do hard work, while in the country such a condition sometimes merely precedes delayed marriage. The care displayed by Dr. Prinzing in all these detailed analyses cannot be too highly praised. In studying, for instance, the deaths during the separate months of the first year, he does not refer all deaths to the number born, but subtracts the number dying each month from the infant population before calculating the rate for the next month. The following table is calculated on this basis:—

## DEATHS OF CHILDREN IN PRUSSIA PER 100 LIVING AT THE CORRESPONDING AGE PERIOD. (LEGITIMATE CHILDREN, 1893-97.)

| Month. | Country. | Cities in General. | Cities with Over 20,000 Inhabitants. | Berlin. |
|--------|----------|--------------------|--------------------------------------|---------|
| 1      | 5.98     | 5.32               | 5.12                                 | 5.30    |
| 2      | 2.30     | 2.34               | 2.36                                 | 2.36    |
| 3      | 1.92     | 2.14               | 2.19                                 | 2.22    |
| 4-6    | 4.23     | 5.02               | 5.22                                 | 5.33    |
| 7-9    | 3.13     | 3.74               | 3.85                                 | 4.03    |
| 10-12  | 2.48     | 2.94               | 3.08                                 | 3.26    |

Evidently the rural conditions are more adverse in the first month of life while those of the city are less favorable after that period. From a study of the statistics as far back as 1876 it appears that the conditions in the country have remained fairly constant while the city death-rates, at first extravagantly high, have been gradually reduced almost to the rural level. The Prussian table may again be quoted:—

DEATHS IN PRUSSIA PER 100 LEGITIMATE BIRTHS.

| Year.   | Country. | All Cities. | Large Cities<br>Except Berlin. | Berlin. |
|---------|----------|-------------|--------------------------------|---------|
| 1876-80 | 18.3     | 21.1        | 23.8                           | 27.1    |
| 1881-85 | 18.6     | 21.1        | 23.7                           | 25.4    |
| 1886-90 | 18.7     | 21.0        | 21.9                           | 24.1    |
| 1893-97 | 18.5     | 19.7        | 20.8                           | 20.5    |

In Saxony there is little difference between the city and country rates, but the former are a trifle lower. In Bavaria the same thing is true to a marked degree, while the smaller German states vary, some resembling Prussia and some Bavaria. The author next proceeds to the consideration of affairs in Austria-Hungary. Here there is an almost universal excess of the rural over the urban infantile death-rate, and this is especially true if the first month of life only be considered. For example, the following table may be cited:—

DEATHS PER 100 LIVING AT THE BEGINNING OF EACH AGE PERIOD

| Age, months.....                       | 1     | 2    | 3    | 4-6  | 7-9  | 10-12 |
|--|-------|------|------|------|------|-------|
| Vienna.....                            | 7.37  | 2.77 | 2.42 | 5.02 | 4.06 | 3.56  |
| Lower Austria (without<br>Vienna)..... | 10.44 | 3.59 | 3.23 | 6.12 | 4.27 | 3.44  |

Finally, Dr. Prinzing reviews the statistics of other European countries: In Switzerland the rural and urban rates are, approximately, equal; in France the cities show a markedly lower infantile death-rate; in Belgium, the Netherlands, England, Sweden, and Finland, on the contrary, the city rate is higher. Seventy Belgian cities gave 17.5 per cent of deaths under 1 year, while the rest of the country gave 14.9 per cent; 12 cities of the Netherlands gave 17.0 per cent, and the rest of the country 15.4 per cent; the rate for

England and Wales was 14.2, and for 28 English cities, 16.1; Stockholm gave 17.0 per cent, and the adjacent country, 10.8; the cities and the country of Finland had rates of 19.6 and 15.8, respectively. In discussing the conflicting figures and their interpretation the author suggests three factors as most markedly influencing the infantile death-rate: the food of the child, principally milk; the protection of the child against cold; and the general intelligent care with which it may be surrounded, including the advantage of medical attendance. The first factor, the milk supply, is most important in the city and where it is potent the urban death-rate will exceed that of the rural districts. The general care of the child and its protection against cold is, on the contrary, least adequate in the country. These suggestions are borne out by certain statistics in which Dr. Prinzing shows that while diarrhoeal diseases of children are most fatal in the cities, whooping-cough is constantly most fatal in the country. It may be noted that tuberculosis is higher in the cities as might be expected. In his final summing up the author points out that the question as to the relation of infantile mortality in city and country cannot be answered off-hand. In most of Prussia, and in certain other North German states, as in England, Sweden, and other northern countries, the city death-rate is the higher; in South Germany, and Austria-Hungary the reverse is the case. The urban mortality is, however, decreasing more rapidly than that of the rural districts, so that in North Germany the difference between the city and country rates is diminishing. The excess of deaths in the country is due mainly to causes acting during the first month of life. Whether, as Dr. Prinzing believes, high city death-rates are due to the calling of nursing mothers away from their children by professional duties, and high country death-rates are caused by a poor artificial food supply for children not nursed by their mothers, seems open to grave question. The essay considered from a statistical standpoint is above criticism, and forms a memorable contribution to sanitary literature.

Dr. E. W. Hope, medical officer of Liverpool, publishes a brief paper on "Infantile Mortality" in *The Journal of State Medicine* for March, 1901. He fixes 100 deaths per 1000 children under 12 years of age as a fair maximum for the non-preventable rate of infant

mortality and discusses the causes producing an excess of this figure. In Liverpool, during 1899, the death-rate under 1 year per 1000 births was 1.98. A detailed study showed that the excessive death-rates were sharply localized. One ward showed a rate of 1.36 and another of 2.74; and in 1082 families there were 2229 deaths under 1 year to only 4574 births. Dr. Hope states that the death-rate under 3 years of age is fifteen times as great among children fed on artificial food as among those fed only at the breast. It is unfortunate that so many general statements are made in this article without the detailed figures upon which they are founded. In connection with the subject of milk supply, the reviewer would call the attention of anyone not familiar with the *Statistisches Jahrbuch der Stadt Berlin* to the invaluable statistics published by Dr. Böckh in that publication. The registration of the source of food supply of almost the entire infant population of Berlin makes it possible to calculate separately the death-rates of each class of feeding. Thus, in 1896, the deaths per million, according to the method of feeding, were as follows:—

|                       | Mothers' Milk. | Animal Milk. | Milk Substitutes. |
|-----------------------|----------------|--------------|-------------------|
| Under 1 month . . . . | 19.14          | 111.09       | 308.0             |
| " 1 year . . . .      | 5.66           | 32.89        | 83.14             |

The fact that putrifying animal milk and not animal milk *per se* causes most of the trouble is shown by the following table from the Year-book for 1897. Here, of course, the figures for the different columns are not comparable, but only the upper and lower rates:—

AVERAGE DAILY NUMBER OF DEATHS OF CHILDREN UNDER ONE YEAR OF AGE  
ACCORDING TO SOURCE OF FOOD SUPPLY.

|                             | Mothers' Milk. | Animal Milk. | Substitutes. |
|-----------------------------|----------------|--------------|--------------|
| Three summer months . . . . | 2.64           | 33.40        | 1.16         |
| Nine other months . . . .   | 2.57           | 13.19        | 0.25         |

Professor P. E. Fahlbeck's study of "La Noblesse de Suède" in Part I of Vol. XII of the *Bulletin de l'Institut International de Statistique* is a careful study of the statistics of a social class. Since 1826 all Swedish families with claim to noble rank have been registered as members of a "Maison de la Noblesse" with detailed genealogical records. Of the total of 3033 families thus registered 2324, or 76.7 are now extinct. It is with these extinct noble families that the author concerns himself. He presents first a table of *family-mortality* as follows:—

NUMBER OF FAMILIES BECOMING EXTINCT OUT OF 1,000 FAMILIES PERSISTING  
AT BEGINNING OF EACH AGE-GROUP.

| Age of family, years                | 0-25 | 26-50 | 51-75 | 76-100 | 101-125 | 126-150 | 151-175 | 176-200 | 201-225 |
|-------------------------------------|------|-------|-------|--------|---------|---------|---------|---------|---------|
| Families of simple nobility .....   | 203  | 214   | 180   | 159    | 170     | 137     | 140     | 109     | 30      |
| Families of counts and barons ..... | 236  | 175   | 148   | 124    | 91      | 69      | ....    | ....    | ....    |

The figures for the later age period, where the number of cases was too small to give average results, are omitted. The striking thing about this table is the rapid extinction of families in the second and third generation, followed by a greater and greater persistence of the surviving races in each succeeding period. Estimating not by years, but by generations, it appears that 84 per cent of the families for which the figures were complete were extinguished in the third generation, and only two out of 1547 persisted in the ninth. Some of the factors contributing to these general results are then considered in detail. Considering only those families which lasted for from two to six generations, M. Fahlbeck finds that the ratio of males married to adult males, and the ratio of fertile marriages to all marriages were low throughout but took a sudden drop in the last generation. For instance, the per cent of sterile marriages to total marriages in the families of five generations was 18.31 in the first, 17.29 in the second, 23.08 in the third, 21.36 in the fourth, and 75.00 in the fifth; in the families of six generations the figures ran as follows: 10.26, 10.00, 19.35, 14.29, 17.07, 70.00. These two tables do not seem to the reviewer especially significant, because the mere fact of a generation being the last, implies celibacy and sterility in a high degree. Again, a table showing a steadily falling number of living children born of each fertile marriage may indicate merely the well-known effect of high civilization and complex social conditions. On the other hand, the fact that the deaths of males under 19 years of age to the living males of that age period has steadily increased is of interest. In the five-generation families this percentage has risen steadily from 17.57 to 43.41, and in the six-generation families from 24.42 to 38.30. Finally, the ratio of female to male children born has increased with remarkable uniformity, as seen in the table below. This condition, probably indicative of a lowered vitality, as well as the increased

death-rate, does seem to bear out the conclusion of the author that the figures show the effects of degeneracy. It is unfortunate that the persisting noble families were not studied for comparison. There are two factors in the class considered,—social conditions and biological conditions. The living families may show the same traits only in a less advanced stage of development; or, on the contrary, the traits noted may be due to the selection of the eliminated weaker stocks, and the existing families may not be decreasing in vitality. General observation would, of course, support M. Fahlbeck's assumption that the phenomena observed are typical of the social conditions.

NUMBER OF MALES TO 100 FEMALES BORN ALIVE.

| Families of            | Generations. |        |        |        |       |
|------------------------|--------------|--------|--------|--------|-------|
|                        | II.          | III.   | IV.    | V.     | VI.   |
| Two generations .....  | 99.41        |        |        |        |       |
| Three    "       ..... | 111.71       | 87.40  |        |        |       |
| Four     "       ..... | 127.71       | 116.73 | 79.08  |        |       |
| Five    "       .....  | 129.08       | 120.15 | 109.62 | 83.23  |       |
| Six     "       .....  | 159.26       | 107.92 | 111.54 | 101.75 | 69.12 |

The high figures in the earlier generations are probably due to failure to record female births.

A. N. Kiær in the *Bulletin de l'Institut International de Statistique*, Tome XII, Livraison I, urges the importance of an investigation of the population of the less-known regions of the globe and its composition. He suggests the study of zones, carefully selected as typical, for an estimate of the demography of each region, and applying his method to Norway, finds that the population of six zones minus the cities is 256,443, giving 1,057,070 for the rest of the country, while the true population is 1,104,639. M. Kiær recommends the establishment of an International Bureau in Switzerland for carrying out such censuses in countries not under the control of the civilized powers. In the same publication is a paper by Dr. J. Körösi entitled "Beitrag zu einer einheitlichen Aufarbeitung der Geburtsstatistik" which shows forcibly some flaws in the statistical system of some, even of the most advanced countries. He gives in tabular

form a view of the statistics relating to births available for the European states. It appears from this table that birth-rates of the separate sexes by months are not available for France, that still-births are not recorded in England and Ireland and are not distinguished from the living-births in Scotland, and that in Portugal and Russia the illegitimate still-births and living-births are combined. Births according to religion are recorded in ten of the twenty-two states considered, and according to nationality only in two.

An article by A. Coste in the January number of the *Journal de la Société de Statistique de Paris* on "Les Lois de la Population d'après M. Gustave Cauderlier" is mainly a review of a volume published by the latter at Brussels and entitled "Lois de la Population et leur application à la Belgique." It appears that M. Cauderlier wishes to modify the third law of Malthus, according to which moral constraint, vice and misfortune are the forces which keep a population down to the level of the means of subsistence by substituting therefor the forces of emigration, voluntary decrease in marriages, and voluntary or involuntary decrease in female fecundity. He has compiled a large amount of statistical material relating to France, England, Scotland, Ireland, Belgium, Holland, and Prussia, and covering a period of fifty years. The general movement of population in Europe appears to show rising marriage, birth and death-rates before 1875 and falling rates after that time. The table illustrating this point for four states is constructed by M. Coste by the remarkable process of adding together the twenty individual rates representing five different years in the four countries. Such figures are, of course, utterly valueless; and this misuse of statistics is in striking contrast with the precautions taken by Cauderlier himself. The main value of the latter's work consists in the fact that after giving the usual rates referred to population, he re-calculates the whole of his tables on a more scientific basis, referring the marriages to the number of single women between 15 and 50 years, the legitimate births to the number of married women between 15 and 50 years, and the deaths of individuals between 20 and 25 years to living persons of that age.

Few statistical questions are in a less satisfactory state than that one just considered, concerning the method of expressing the marriage rates. M. Cauderlier suggests a further refinement in an extension



of his views on Malthusianism in the March number of the *Journal de la Société de Statistique de Paris* entitled "Etude sur les lois de la population et la loi de Malthus" in which he points out that even the reference of the number of marriages to the female population between the ages of 15 and 45 is not always accurate. He shows that a rate so calculated is affected by the social conditions governing the age at which marriage occurs, and by the frequency of marriages during the years previous, because the number of marriages will really depend not upon the total number of persons—but upon the number of unmarried persons—between 15 years and 45. For example, the ratio of marriages to female population of the given age in 1881 was 66.70 per 1000 in France, and 55.49 in Belgium. On the other hand, if the number of marriages is referred to the number of women reaching each year the mean age of marriage (25.5 years in France, 28.5 years in Belgium), the relations are reversed, the French rate being .869, and the Belgian rate .946. Considering the smaller population and the lessened fecundity at the more advanced age it seems to the reviewer a question whether the former ratio is not really the more significant. Better than any ratio perhaps would be the graphic method which has proved so instructive as applied to mortality statistics by Pearson.

Valuable additions to the statistical literature of antitoxin have been made in two recent numbers of the *Centralblatt für allgemeine Gesundheitspflege*. In the seventh and eighth parts of Vol. XIX, 1900, Dr. J. Weissenfeld, of Bonn, compares the death-rates from diphtheria and scarlet fever for a period of years in various European states. He notes the possible error introduced in the comparison of fatality statistics by the fact that light cases of diphtheria, which might often have passed unnoticed, are now reported in order to secure antitoxin treatment. His own figures are derived from the *Veröffentlichungen des k. Gesundheits-Amtes* and cover ten years in the foreign countries, twenty years in the German states, and thirty years in certain German cities. In almost every instance the rates for diphtheria and croup show a gradual decrease, with individual variations; and a sudden drop in 1895, when the use of antitoxin became general. The only exception is in the case of England, where the introduction of antitoxin in private practice has been very

slow, and where the death-rate before 1895 was so low as to indicate a widespread natural immunity against the disease. This sharp decrease is not shown by the scarlet fever statistics except, curiously enough, in England. The most striking table given by Dr. Weissenfeld is the following:—

DEATHS FROM DIPHTHERIA AND CROUP PER 10,000 POPULATION.

| Year. | Germany. | Austria. | Belgium. | France. | Netherlands. | Switzerland. | England. |
|-------|----------|----------|----------|---------|--------------|--------------|----------|
| 1889  | 10.9     | 7.11     | 3.87     | 6.58    | ....         | 5.96         | 2.58     |
| 1890  | 10.1     | 7.35     | 3.71     | 6.11    | ....         | 7.65         | 2.42     |
| 1891  | 8.5      | 8.83     | 3.31     | 6.05    | 4.95         | 8.20         | 2.14     |
| 1892  | 9.7      | 9.49     | 2.65     | 5.42    | 4.46         | 5.20         | 2.55     |
| 1893  | 12.6     | 9.56     | 4.03     | 5.48    | 4.05         | 10.20        | 4.31     |
| 1894  | 10.2     | 10.20    | 4.59     | 4.07    | 3.31         | 8.00         | 3.79     |
| 1895  | 5.4      | 6.28     | 2.86     | 1.95    | 1.45         | 3.40         | 3.52     |
| 1896  | 4.3      | 4.92     | 1.59     | 1.85    | 2.47         | 3.37         | 3.86     |
| 1897  | 3.5      | 4.69     | 1.31     | 1.25    | 2.24         | 2.97         | 3.14     |
| 1898  | 3.4      | 3.85     | 1.41     | 1.22    | 1.71         | 3.71         | 3.09     |

The second paper referred to is by Dr. V. Doovertie, and consists of a comparison of the diphtheria and scarlet fever death-rates in the Swedish cities. From 1861 to 1894 the death-rate from diphtheria and croup ranged from 4.1 to 12.4; for the years 1895–99 the figures are 4.5, 2.6, 2.7, 4.2, and 6.7; and the average for 1895–99 is 4.2, considerably lower than that for any previous five-year period. The scarlet fever death-rate, however, shows a much more striking diminution than that from diphtheria. Before 1895 it ranged from 3.2 to 17.6; since 1895 the highest rate has been 1.5, and the average for 1895–99 is 1.4. This sudden decrease is very curious. It must, however, be connected with the fact that the scarlet fever rate before 1895 was abnormally large. The minimum death-rate given by Doovertie for a five-year period before 1885 is 5.4 and the highest 12.5.

No. IV of Vol. I of the *Boletín Demografico Argentino*, published by the Minister of the Interior of the Argentine Republic for October, 1900, contains reviews of the movement of population in the city of Rosario de Santa Fé from 1730 by Gabriel Carrasco, and in the city of Corrientes from 1800 by Cayetano Ripoll, and

a paper on tuberculosis in the city of Buenos Aires also by Carrasco. The latter study covers the period from 1872 to 1899, and the author shows that while the general death-rate, per 10,000 inhabitants, fell from 292 in 1872-74 to 247 in 1890-94 the tuberculosis rate decreased from 32 to 22. Of late, however, the improvement has not continued. The general death-rate fell to 191 in 1895-99, but the tuberculosis rate remained 21, or over 10 per cent of the total mortality. An analysis by districts shows that in certain parishes the tuberculosis deaths have amounted to 38 and 42 per 10,000 inhabitants, the high death-rates corresponding in general with poor sanitary conditions. A study of the monthly variations shows that pulmonary tuberculosis attains a maximum in November, while plots of the humidity and temperature show almost parallel curves to that of the disease but with later maxima, in December and January, respectively. The Rosario statistics include records of births, deaths and marriages from the parish books back to 1730, when there were 15 births, 7 marriages, and 4 deaths. The movement of the population since 1880 is indicated on a chart notable for a picturesque symbolism. Each point on the curve of natality is marked by a circle including a child's face, while the mortality curve has a death's head at each point. For marriage curves Dr. Carrasco uses a circle enclosing two hearts pierced by an arrow, and for divorces a circle with two clenched fists. The most significant figures in the Corrientes' tables are those columns which show the legitimate and illegitimate births from 1800. The average yearly number of legitimate births in 1800-04 was 273, and of illegitimate births the average was 125. In the period 1815-20 the figures were 162 and 141; ten years later the illegitimate births began to be in excess; in 1825-29 there were 101 legitimate births and 142 illegitimate; in 1845-49 the averages were 175 and 301; and in 1895-99, 304 and 682. Presumably, as in the case of the West Indian Islands, the large proportion of illegitimacy is the result of the excessive marriage fees which lead many persons, not of otherwise irregular lives, to live together without the religious ceremony.

The Milroy Lectures on "Public Health and Housing," delivered by Dr. J. F. J. Sykes, and published in *The Lancet* for March 2, 1901, include a good summary of the principal statistics available on

the subject of overcrowding. The author begins with the table published thirty years ago by Dr. Farr in support of his formula, according to which the mortality of a district was nearly as the eighth root of the density of the inhabitants, and adds Dr. Tatham's table, and statistics for Berlin, certain Scotch cities, Glasgow, Baden, some European cities, and several districts of London. The following figures for certain districts in the latter city, in 1888-90, are of interest:—

|  | Boundary St.<br>Area. | St. Matthew,<br>Bethnal Green. | London. | Churchway<br>Area. | Somers Town. | St. Pancras. |
|--|-----------------------|--------------------------------|---------|--------------------|--------------|--------------|
| Density population per acre .....                  | 373                   | 168                            | 58      | 446                | 183          | 88           |
| Death-rate per 1,000 population .....              | 39.3                  | 22.5                           | 18.9    | 37.4               | 23.1         | 19.1         |
| Death-rate under 1 year per 1,000 population ..... | 252                   | 159                            | 151     | 393                | 172          | 153          |

In all such statistics it must be remembered that many factors enter into the problem. Besides the bad air and the opportunity for the spread of infection, implied in overcrowding, many correlated disadvantages, such as poor protoplasm, poor food, intemperate habits, etc., are likely to increase the death-rate in tenement population. For this reason the most significant table quoted by Dr. Sykes is that which relates to the sanitary condition of the British army, the different arms of which organization differed, as is stated, only in the amount of overcrowding in barracks. The only change in the environment of the troops between the two periods considered was an increased cubic air space per head.

#### MORTALITY FROM LUNG DISEASES.

|                               | 1837-46. | 1864-70. |
|-------------------------------|----------|----------|
| Household Cavalry . . . . .   | 6.28     | 3.76     |
| Cavalry of the Line . . . . . | 5.65     | 1.41     |
| Foot Guards . . . . .         | 11.90    | 2.30     |
| Infantry . . . . .            | 7.75     | 2.12     |

In *The Lancet* for April 13, 1901, some interesting Russian statistics are quoted which show a startlingly high infantile death-rate in

certain districts, attributed to irregular and unsuitable feeding of children in the peasant families. The Russian birth-rate is high, from 37 to 46 per 1000; but 268 out of every 1000 die in the first year of life. In the north-eastern half of the country for the four years 1893-96 there died 3,242,065 children out of 10,037,287 born, and in certain districts half the children born never survive their first year, the rate rising in some years to 626 per 1000. The same issue of *The Lancet* contains the preliminary results of the third general census of India, taken on the night of March 1st, and published with remarkable celerity, in a fortnight. The census shows a population of 294,266,702, an increase of 2.42 per cent over the census of 1891. Deducting tracts not included ten years ago the increase is only 1.49 per cent as against 11.2 per cent in the previous decade. The population of British India has increased 4.44 per cent, but that of the native states has fallen 4.34 per cent. These unfavorable results are due to the successive famines and the plague which has ravaged the unhappy country.

A paper "On the Correlation between Duration of Life and the Number of Offspring," by Miss M. Beeton, G. N. Yule, and Karl Pearson, published in the *Journal of the Institute of Actuaries*, for January, 1901, is as satisfactory a piece of work as are most publications by Professor Pearson. The purpose of this study is to determine whether there is any relation between longevity and fecundity which would permit the action of natural selection in human society in spite of the fact that the elimination of the unfit often takes place only after the period at which the species is mainly propagated. Statistics were obtained for four different series, including the ages at death and the number of children of (1) the women of the Whitney family, of American Quakers, (2) English women belonging to the Society of Friends, (3) American men of the Whitney family, and (4) men belonging to the class of English landed gentry. When the ages at death and the mean size of families were plotted the four series were found to be in substantial agreement. In each case the size of the family increased with the age at death, but more rapidly before fifty years than after. The points fall pretty closely along two straight lines one for the period from twenty years to fifty, and the other running from fifty years to ninety; but the entire curve

coincides even more satisfactory with a cubical parabola. It appears then that fecundity and longevity are correlated even after the age of fertility has passed. The American population shows a shorter average life (the women particularly having a very excessive maximum frequency of deaths between 35 and 40), a smaller fertility, and a closer connection between age at death and size of family. The most significant feature of the investigation is the tendency it discloses toward the evolution of a longer-lived race. In the four groups considered the longer-lived moiety of the parents produced 64.0, 55.2, 61.1, and 53.5 per cent of the children, respectively. Such a selective action as this would materially increase the longevity of the race and might account for a large part of that increased expectation of life which we are accustomed to attribute to improvements in sanitation.

A paper on "The Comparative Pathology of the Jews," by Dr. Maurice Fishberg, published in the *New York Medical Journal* for March 30 and April 6, 1901, is an excellent compilation of the statistics of this subject, although it contains no original material. Racial mortality rates from Prussia, Austria-Hungary, Roumania, Holland, Algiers, England, and other states are cited to show the generally lower death-rate of the Jewish people. Dr. Billings' report on the vital statistics of the city of New York for the six years prior to 1890 is quoted at some length, showing a death-rate at ages of 23.43 among persons born of American mothers, and of 14.85 among persons born of Russian and Polish mothers. The author then discusses the notably low death-rate among Jews from the infectious diseases. Relative immunity from small-pox has been attributed to more general vaccination; and freedom from tuberculosis to the sanitary control of food supplies. These causes cannot, however, contribute to the low death-rate from cholera; or to the immunity from the Black Plague which caused the Jews to be persecuted as accomplices of the devil in the middle ages. Alcoholism and syphilis are rare among the Jews, and this has been attributed to greater chastity. The abundance of gonorrhea, however, seems to throw doubt on this reasoning. Finally, diabetes and nervous disorders are shown to be very excessive among the Jewish people, the proportion of insanity being about double that observed in adjacent Christian

populations. Dr. Fishberg's discussion of the causes of the observed phenomena seems to the reviewer a very satisfactory and thoughtful one. He points out that most of the factors suggested to explain the longevity of the Jews, such as prosperous living, rich food, sanitary regulations, strong family feeling, and good morals are insufficient to produce the observed results; and he concludes that the natural immunity of the Jew is simply the product of an unusually severe process of natural selection continued for many generations in the process of which the weak, sickly and infirm have been "eliminated from the race either by death or baptism."

The monograph on "The Past and Present Condition of Public Hygiene and State Medicine in the United States," prepared by Dr. S. W. Abbott for the United States Social Economy Exhibit at the Paris Exposition, contains a large amount of valuable material relating to sanitary practice. In the main body of the report tables and maps are given which show the extension of water-supply and sewerage systems, and the proportion of registered physicians in the various States, the annual per capita expenditure of State Boards of Health (ranging from \$0.0001 in Nebraska to \$0.0866 in Florida), and the extent of overcrowding in the larger cities. Dr. Abbott gives the following list of States which have maintained a fairly complete system of collection and publication of vital statistics for several years with the date of their beginning: Massachusetts, 1842; Connecticut, 1848; Rhode Island, 1853; Vermont, 1857; New Jersey, 1878; New Hampshire, 1880; Delaware, 1881; Maine, 1892; New York, 1893; and Michigan, 1897. Statistics of the infectious diseases were obtained from 6 States and 19 cities, of which the following table is a summary. Such fatality rates are, of course, always too high, but the subject is one of great interest.

| Diseases.              | Reported Cases. | Registered Deaths. | Fatality (per cent). |
|------------------------|-----------------|--------------------|----------------------|
| Small-pox.....         | 9,222           | 2,385              | 25.8                 |
| Typhoid fever.....     | 69,758          | 13,284             | 19.0                 |
| Diphtheria and croup.. | 195,783         | 44,411             | 22.7                 |
| Scarlet fever.....     | 117,847         | 9,211              | 7.2                  |
| Measles .....          | 217,755         | 6,424              | 2.8                  |

In the appendices to the *Monograph* are tables of municipal statistics which are of great value, although some of them are not wholly reliable. The general death-rates for 1898, of 6.29 in Omaha, 8.51 in St. Paul, and 8.62 in Minneapolis, for example, are incredible. The percentage of consumption to the total mortality is over 10 in all but 7 of the 32 cities considered, and is over 13 in 6 of them. The range of cholera infantum is remarkably wide, from .7 per cent of the total mortality in San Francisco to 11.8 per cent in Milwaukee. Cancer varies from 1 to 5 per cent of the total, being generally about 3 per cent. A table of the typhoid fever death-rate for nine years in the cities with a population of over 50,000 shows New York and Brooklyn at one end of the list with rates between 15 and 22 per 100,000 population, and Albany, Jersey City, Pittsburgh, and Washington at the other end, ranging from a minimum of 50 to a maximum of 89 in Washington, and of over 100 in the other three cases. It is needless to say that all these last cities have polluted water supplies.

The *Second Annual Report of the Massachusetts State Board of Insanity for 1900* contains interesting statistical material. The table showing the annual increase of the insane for the last ten years is of special interest. Comparing the number of persons cared for in institutions and in private families under the charge of the State board and the overseers of the poor, it appears that the average daily increase has risen from 233.26 in 1890-95 to 330.47 in 1895-1900. The rise is mainly due to that class of patients treated in the State institutions which showed a daily average increase of 187.47 in the former, and of 342.32 in the latter period. The daily increase in the city and town hospitals and almshouses is much less in the second period than in the first; while the patients cared for in families and in private institutions shows an actual decrease. In considering the figures for the grand total, the Commissioners note that it is erroneous to conclude from an increase in the population of institutions for the insane that an actual increase has taken place in the amount of insanity in the community. They point out that an increase in the number of registered insane may be due merely to an improvement in "the accuracy and completeness of records, the adequacy of public provision, the degree of public confidence in special institu-



tions for such, the potency of influences outside the family compelling commitment, and the method and strictness of classification of the insane." The influence of growing confidence in public institutions is shown clearly by the disproportionate increase in the number of the senile and the feeble-minded, classes of persons whose commitment is not forced by necessity but is a sign of readiness to entrust dependents to the public care. While the mean population of the State increased only 42.42 per cent between 1880 and 1900, and the total commitments of the insane only 86.63 per cent, the commitments to insane hospitals of persons over 70 years of age increased 156.81 per cent, and the commitments of the feeble-minded to insane hospitals increased 381.33. The greater frequency with which insanity is now recognized is shown by the large increase in the transfers from pauper and criminal institutions to those designed for the insane. Thus at the Tewksbury State Hospital the average annual number of such transfers was 26.6 from 1891-96; it rose to 84.25 in the period since 1896. The average annual number of commitments to the Asylum for Insane Criminals has risen from 27.6 before 1899 to 41 in 1899 and 62 in 1900, while the whole number of criminals in the State has decreased.

The *Fifteenth Annual Report of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania* contains abstracts of the annual reports of the various cities and boroughs for the year 1898 which illustrate forcibly the disadvantages of a lack of uniformity in the registration of statistics. Allentown, New Brighton, Pittsburg, and Reading record deaths by causes and ages of decedents, but not by months; Altoona, Erie, Hazelton, Lancaster, Latrobe, McKeesport, and Shenandoah report the months of death, but not the ages of decedents; other large cities report neither. A uniform schedule by which the data for the different cities could be compared, and from which the rates for the entire State could be calculated, would immensely increase the value of this report. Besides the four cities mentioned above only Philadelphia gives statistics of infantile mortality, a subject which is probably of more practical importance than any other except the general birth and death-rate. The following table is an eloquent arraignment of a crime against American civilization:—

## DEATHS FROM TYPHOID FEVER IN THE CITY OF PHILADELPHIA.

| Year.     | Deaths. | Rate per 100,000. | Year.     | Deaths. | Rate per 100,000. |
|-----------|---------|-------------------|-----------|---------|-------------------|
| 1889..... | 736     | 70.7              | 1894..... | 370     | 32.4              |
| 1890..... | 666     | 63.6              | 1895..... | 469     | 40.2              |
| 1891..... | 683     | 64.0              | 1896..... | 402     | 33.81             |
| 1892..... | 440     | 40.2              | 1897..... | 401     | 33.02             |
| 1893..... | 456     | 40.8              | 1897..... | 639     | 45.61             |

The only general summary, given in this report, which includes the whole State is a table of births and deaths and morbidity and fatality of infectious diseases. The totals under this last head are of interest as showing the difficulty of securing the reporting of tuberculosis. The number of cases of diphtheria must also be too low : —

## STATE OF PENNSYLVANIA, 1898.

|            | Diphtheria<br>and Croup. | Small-pox. | Scarlet<br>Fever. | Typhoid<br>Fever. | Consump-<br>tion. | Measles. |
|------------|--------------------------|------------|-------------------|-------------------|-------------------|----------|
| Cases .... | 7,963                    | 56         | 4,525             | 11,845            | 255               | 3,827    |
| Deaths...  | 1,819                    | ..         | 235               | 1,422             | 4,008             | 146      |

No. 13 of Vol. XVI of the *Public Health Reports of the U.S. Marine Hospital Service* contains a review of the health of the city of Rio de Janeiro for 1900 which illustrates the difficulties in the way of the statistician. The population of the city at the end of 1900 as estimated by the sanitary authorities was 793,000; while a census taken December 31st showed only 431,716, the census being perhaps not much more accurate than the estimate. The general death-rate of 17.9 per 1000 calculated on the larger population is probably much too small. The ratios of deaths from certain causes to the total mortality are of interest. Tuberculosis is of prime importance with 19.5 per cent of total deaths; malarial and pernicious fever cause 7.3 per cent; diseases of the heart and arteries are credited with 11.9 per cent; cancer and pneumonia cause only 1.4 per cent and 1.3 per cent of the total deaths, respectively.

The *Twenty-third Annual Report of the Board of Health of the City of Lowell* includes considerable statistical material. The year

1900 shows an encouraging improvement in sanitary conditions; a decrease of the general death-rate from 20.50, the lowest previous rate, in 1899, to 19.47; a decrease in the per cent of deaths under 5 years of age, to the total deaths, from 41.8 to 37.1, and a decrease in deaths from cholera infantum and diarrhœal diseases, and from diphtheria. Certain of the tables, especially a table of deaths classified by groups of diseases, might well have been omitted and replaced by fuller statistics of fatality rates and monthly incidence of the infectious diseases.

The *Annual Report of the Board of Health of Cambridge, Mass.*, for 1900, contains very full statistics with regard to the principal zymotic diseases, including mortality, morbidity, and fatality rates for ten years. The averages for the whole period, 1891-1900, are as follows:—

|                     | Mortality per 1,000<br>Population. | Morbidity per 1,000<br>Population. | Fatality per 100<br>Cases. |
|---------------------|------------------------------------|------------------------------------|----------------------------|
| Scarlet fever . . . | 0.31                               | 4.37                               | 5.66                       |
| Diphtheria . . .    | 0.66                               | 4.07                               | 20.50                      |
| Typhoid fever . . . | 0.21                               | 1.37                               | 15.70                      |
| Measles . . . . .   | 0.24                               | * 2.98                             | * 1.27                     |

\* 1895-1900.

It has been suggested that the note on the *Bertillon Classification of the Causes of Death* in the December number of this journal might be interpreted as an attack upon the whole movement toward uniformity. The author of the note wishes to disclaim any intention of taking such a position. A uniform system for the nomenclature of diseases is an essential for the progress of vital statistics and the devoted labors of those who have worked for its adoption deserves the greatest praise. The classification of M. Bertillon need not, however, be adopted along with his schedule of the individual diseases, and the most distinguished advocate of the Bertillon nomenclature in this country has suggested in correspondence that the use of the nomenclature need not imply that of the classification as well. It is the irrational and unscientific classification by affected organs alone against which the writer protested; and in his opinion the abandonment of this classification, or the substitution for it of an etiological one, would most effectually promote the acceptance of the Bertillon nomenclature and the progress of uniformity.

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